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(54) **Wiring structure and wiring method for motorcycle**

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Description

[0001] The present invention relates to a wiring structure and a wiring method for a motorcycle to electrically connect an electric part supported on a handlebar cover of the motorcycle, such as a meter or switch, with a conductor installed in the handlebar cover.

[0002] Wiring for electric parts such as meters and switches provided on a handlebar cover covering the handlebar of a motorcycle has been accomplished by use of a wiring harness (see Japanese Patent Application Laid-Open No. 60-244680, for example).

[0003] In the above conventional wiring, connectors provided at the ends of a wiring harness need to be connected to electric parts such as meters and switches on the inner side of the handlebar cover after the electric parts are attached to the handlebar cover. This causes the problem that the connection and disconnection work of the connectors is troublesome and assembly time is relatively long. In addition, since the front and rear handlebar covers cannot be joined together until after the wiring work is completed, there is the possibility that work efficiency may be poor. Another drawback is that the wiring harness easily tangles and coils during wiring, degrading the assembly work efficiency and giving rise to the possibility that short-circuits, wire breaks and erroneous connections may occur.

[0004] US 4386278 discloses a wiring harness for motorcycles. A junction box is provided in a headlamp casing, to which various components such as subfuses and connectors may be fitted. The connectors are connected by wires to electrical devices of the motorcycle.

[0005] FR 2720042 discloses the fixing of a circuit board to a meter case in, for example, a motorcycle.

[0006] According to a first aspect of the present invention, there is provided a wiring structure for a motorcycle to electrically connect a meter supported on a handlebar cover of the motorcycle to conductors arranged inside the handlebar cover, wherein a handlebar cover side connector of the wiring structure, connected to the conductors, is provided inside a meter support hole formed in the handlebar cover and the meter is inserted into the meter support hole thereby to connect a meter side connector of the wiring structure, provided in the meter, to the handlebar cover side connector.

[0007] With the above construction, simply inserting the meter into the meter support hole formed in the handlebar cover results in the connection between the meter side connector of the meter and the handlebar cover side connector inside the meter support hole, so that the wiring between the conductors arranged inside the handlebar cover and the meter can be completed easily and reliably.

[0008] According to a second aspect of the present invention, there is provided a wiring structure for a motorcycle to electrically connect a switch supported on a handlebar cover of the motorcycle to conductors arranged inside the handlebar cover, wherein the conductors are comprised of busbars made of a metal plate or a metal bar embedded in a busbar embedding substrate of a synthetic resin, tip ends of the busbars are projected from the busbar embedding substrate toward an opening formed in the handlebar cover to form busbar side connector terminals of the wiring structure, and switch side connector terminals of the wiring structure, provided inside the switch, are inserted into the opening to connect the busbar side connector terminals and the switch side connector terminals.

[0009] With this construction, simply inserting the switch side connector terminals provided to the switch from the opening of the handlebar cover causes the switch side connector terminals to be connected to the busbar side connector terminals projecting from the busbar embedding substrate, automatically completing the wiring for the switch. Further, because the above-mentioned wiring work can be performed from outside the handlebar cover, the handlebar cover can be assembled beforehand, thus enhancing the work efficiency. Because the conductors connected to the switch are formed of a metal plate or a metal bar embedded in a synthetic resin, not only can the number of parts and manhours required for wiring be reduced but the possibility of short-circuit, wire break and erroneous assembly can also be reduced, compared with a case where the conventional wiring harness is used. Durability for long-term use is also improved over what is obtained by the wiring harness. Further, since the front ends of the busbars are projected from the busbar embedding substrate to form busbar side connector terminals, it is possible to reduce the parts count of the connectors and also the frequency of incidents of poor contacts and wire breaks, thus enhancing the reliability. Furthermore, because the switch side connector terminals are provided inside the switches, their deformations and damages can be prevented, thereby improving the electric contact reliability.

[0010] In accordance with a third aspect of the present invention, there is provided a wiring method for a motorcycle to supply electricity to an electric part supported on a handlebar cover of the motorcycle, comprising:

a step of injection-molding a busbar embedding substrate of a synthetic resin having a plurality of busbars made of a metal plate or a metal bar embedded therein, the busbars having tip ends which project from the busbar embedding substrate to form busbar side connector terminals;

a step of injection-molding a handlebar cover made of a synthetic resin to enclose at least a part of the busbar embedding substrate, the handlebar cover having an opening towards which the busbar side connector terminals project; and

a step of mounting the electric part on the handlebar cover the electric part having electric part side connector terminals disposed so that movement of the electric part into position on the handlebar cover

electrically connects the electric part side connector terminals to the busbar side connector terminals.

[0011] With the above method, the use of the busbar embedding substrate having the busbars embedded therein can reduce the number of parts and manhours required for wiring, compared with a case where the wiring harness is used. In addition, this wiring method can reduce the possibility of short-circuits, wire breaks and erroneous assembly and therefore can offer a better long-term durability than the method that the wiring harness is used.

[0012] According to a fourth aspect of the present invention, there is provided a handlebar cover for a motorcycle, having an electrical component which, in use, is visible or actuable by a rider of the motorcycle, the electrical component being mounted in an aperture in the handlebar cover and being connected to conductors accommodated within the handlebar cover, characterized in that the electrical component is connected to the conductors by a connector having a first part fixed to the handlebar cover and a second part fixed to the electrical component, whereby the two parts of the connector are engaged with one another by movement of the electrical component into the aperture.

[0013] For a better understanding of the present invention, and to show more clearly how it may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:-

Fig. 1 is a rear view of a motorcycle;
Fig.2 is an enlarged view of part of the motor cycle of Fig.1 showing the outer face of a rear handlebar cover;
Fig.3 shows the inner face of the rear handlebar cover;
Fig.4 is a cross section view taken along the line 4-4 of Fig.3;
Fig.5 is a cross section view taken along the line 5-5 of Fig.3;
Fig.6 is an enlarged view of part of Fig.5;
Fig.7 shows a busbar embedding substrate;
Figs.8A and 8B are enlarged views of part of Fig.7;
Fig.9 is a perspective view of a female connector for attachment to a meter;
Fig.10 is an enlarged cross section taken along the line 10-10 of Fig.2;
Fig.11 is a perspective view of a male terminal and a female terminal of a connector of a switch;
Fig.12 is a perspective view of a starter switch;
Fig.13 is a wiring diagram with busbars;
Fig.14 is a cross section view similar to Fig.5, but showing a second embodiment;
Fig.15 shows a cross section view taken along the line 15-15 of Fig.14;
Fig.16 is similar to Fig.10, but shows a third embodiment;
Fig.17 is an enlarged cross section view similar to Fig.10 but shows a fourth embodiment; and
Fig.18 is a perspective view of male and female terminals of a connector of a switch of the fourth embodiment.

[0014] Fig. 1 is a rear view of a scooter type motorcycle, which has the rear part of a handlebar covered with a rear handlebar cover 1 of synthetic resin, from the ends of which project a left grip 2 and a right grip 3.

[0015] Fig.2 is an enlarged view of the outer face of the rear handlebar cover 1 (the side that can be seen by a rider), at the center of which is provided a meter unit 5 covered with a transparent meter cover 4. The meter unit 5 includes a speedometer 6, a fuel gauge 7, an odometer 8, a speed warning lamp 9, an indicator warning lamp 10, and an oil warning lamp 11. The rear handlebar cover 1 has a starter switch Ss at the right end thereof and a dimmer switch Sd, an indicator switch Sw and a horn switch Sh at the left end thereof. The meter unit 5, starter switch Ss, dimmer switch Sd, indicator switch Sw and horn switch Sh all constitute the electric parts of this invention.

[0016] Fig.3 shows the rear handlebar cover 1 of Fig. 2 as seen from the back of the drawing. The inner face of the rear handlebar cover 1 is normally covered by a front cover (not shown) so that it cannot be seen from outside. On the inner face of the rear handlebar cover 1 are laterally arranged a busbar embedding substrate 21 in place of the conventional wiring harness. The meter unit 5, starter switch Ss, dimmer switch Sd, indicator switch Sw and horn switch Sh are connected to a battery and electric parts provided on other parts of the motorcycle V through busbars 22 embedded in the busbar embedding substrate 21.

[0017] Fig.7 shows a busbar embedding substrate 21 alone, made by the injection molding of a synthetic resin, in which a number of conductive busbars 22, punched from a metal plate, are embedded. The busbar embedding substrate 21 has ten openings 21_1-21_{10}, through which a part of the busbars 22 is exposed. Because each of the busbars 22 is formed of a fine and thin metal strip, it is difficult to embed these busbars 22 with positioning in an orderly manner in the busbar embedding substrate 21 when injection-molding the busbar embedding substrate 21. Hence, a plurality of busbars 22 are integrally connected by connecting portions 23 at areas corresponding to the openings 21_1, 21_2 of the busbar embedding substrate 21(see shaded portions in Fig. 8A).

[0018] Interconnecting the plurality of busbars 22 by the connecting portions 23 can prevent the busbars 22 as an assembly set from coming apart, thus facilitating its manufacture and handling. Further, when setting the busbars 22 as an assembly set in the molding die for the injection molding of the busbar embedding substrate 21, the portions of the busbars 22 that are integrally connected together through the connecting portions 23 are held to face the openings 21_1, 21_2 in the busbar embed-

ding substrate 21 so that the positioning of the busbars 22 can be facilitated and made reliable.

[0019] After the busbar embedding substrate 21 is injection-molded, the connecting portions 23 of the busbars 22 facing the openings 21_1, 21_2 are cut and removed to electrically isolate the individual busbars 22 from each other, as shown in Fig.8B. Because the connecting portions 23 of the busbars 22 can be cut and removed by using the openings 21_1, 21_2, special openings need not be formed. While in the above description two 21_1, 21_2 of the ten openings 21_1-21_{10} in the busbar embedding substrate 21 are taken as an example, the same applies to the remaining eight openings 21_3-21_{10}.

[0020] As can be seen from Fig.7, the busbar embedding substrate 21 has integrally formed therewith at the central part a male connector 24 for providing a connection to a battery and electric parts provided on the other parts of the motorcycle V, and a male connector 25 for providing a connection to the meter unit 5. The busbar embedding substrate 21 has formed at one end thereof an opening 26 in which the starter switch Ss is installed, and also has formed at the other end thereof three openings 27, 28, 29 in which the dimmer switch Sd, indicator switch Sw and horn switch Sh are installed. These openings 26-29 are integrally provided with male connectors 30-33 respectively. The rear handlebar cover 1 is provided with four openings 34-37 that correspond to the openings 26-29 formed in the busbar embedding substrate 21 (see Fig.2).

[0021] As shown in Fig.13, the male connector 24 to be connected to the battery and electric parts, the male connector 25 to be connected to the meter unit 5, and the male connectors 30-33 to be connected to the four switches Ss, Sd, Sw, Sh are interconnected by the plurality of busbars 22.

[0022] When injection-molding the rear handlebar cover 1 with a synthetic resin, the busbar embedding substrate 21 is set in a molding die so that it is formed integral with the rear handlebar cover 1. That is, a collar 21_{11} protruding from the outer peripheral part of the busbar embedding substrate 21 (see Fig.7) is embedded in a rib portion 1_{10} of the rear handlebar cover 1 so that the busbar embedding substrate 21 can be supported on the rear handlebar cover 1 (see Fig.5). Fig.3 shows the busbar embedding substrate 21 formed integral with the rear handlebar cover 1. As shown in the figure, the busbar embedding substrate 21 is supported on the rear handlebar cover 1 by seven bridge portions 1_1-1_7 that are part of the rear handlebar cover 1. As apparent from Fig.3 and Fig.7 combined, the bridge portion 1_1 is formed to cover two openings 21_1, 21_2 in the busbar embedding substrate 21; the bridge portion 1_2 is formed to cover an opening 21_3; the bridge portion 1_3 is formed to cover an opening 21_4; the bridge portion 1_4 is formed to cover two openings 21_5, 21_6; the bridge portion 1_5 is formed to cover two openings 21_7, 21_8; the bridge portion 1_6 is formed to cover an opening 21_9; and the bridge portion 1_7 is formed to cover an opening 21_{10}.

[0023] Fig.4 shows the bridge portion 1_4, one of the seven bridge portions 1_1-1_7, in cross section. In the bridge portion 1_4 is situated the opening 21_5 of the busbar embedding substrate 21, which is embedded by the synthetic resin that forms the rear handlebar cover 1. Hence, the eight busbars 22 exposed in the opening 21_5 are completely covered with the synthetic resin and thus insulated from one another.

[0024] Because in this construction the busbar embedding substrate 21 embedding the plurality of busbars 22 is molded of synthetic resin and, during the process of molding the rear handlebar cover 1, is formed integral with the rear handlebar cover 1 by seven bridge portions 1_1-1_7, there are the following advantages.

[0025] First, by forming separate from the rear handlebar cover 1 the busbar embedding substrate 21 which is relatively complex in structure because of the embedded busbars 22, the molding die for the busbar embedding substrate 21 and the molding die for the rear handlebar cover 1 can be simplified in construction.

[0026] Second, because the busbar embedding substrate 21 is formed separately from the rear handlebar cover 1, the thickness of the rear handlebar cover 1 can be made uniform without being affected by the thickness of the busbar embedding substrate 21. Consequently, molding sinks can be prevented, thereby enhancing the appearance of the rear handlebar cover 1.

[0027] Third, because the busbar embedding substrate 21 is formed integral with the rear handlebar cover 1 by embedding the busbar embedding substrate 21 in the plurality of bridge portions 1_1-1_7, the busbar embedding substrate 21 and the rear handlebar cover 1 reinforce with each other to increase the overall rigidity.

[0028] Fourth, because a synthetic resin is automatically filled into the openings 21_1-21_{10} of the busbar embedding substrate 21 when embedding the busbar embedding substrate 21 in the bridge portions 1_1-1_7, no special separate filling process is required, thereby reducing manhours.

[0029] Next, the process of mounting the meter unit 5 onto the rear handlebar cover 1 will be explained by referring to Figs.3 to 5.

[0030] The meter unit 5 has a container-shaped housing 41 that supports the speedometer 6, fuel gauge 7, odometer 8, speed warning lamp 9, indicator warning lamp 10 and oil warning lamp 11. A meter panel 42 is held between the opening of the housing 41 and the meter cover 4. A plurality of engagement claws 41_1 are formed on the outer periphery of the housing 41. These engagement claws 41_1 project into claw receiving portions 4_1 formed in the meter cover 4 to hold together the housing 41 and the meter cover 4 (see Fig.4).

[0031] The meter unit 5 is inserted from above into a meter unit support hole 43 recessed at the central part of the rear handlebar cover 1. At this time, as shown in Fig.4, an engagement claw 41_2 formed on the rear side (rider side) of the housing 41 engages a claw receiving portion 1_3 which is formed so that it may face the meter

unit support hole 43. Also as shown in Figs.3 and 5, two lateral engagement claws 41_3 formed on the front side of the housing 41 engage two claw receiving portions 1_9, 1_9, with the result that the meter unit 5 is fixed to the rear handlebar cover 1.

[0032] As shown in Figs.3 and 5, when the meter unit 5 is inserted into the meter unit support hole 43, a female connector 44 provided in the meter unit 5 is automatically coupled to the male connector 25 formed integral with the busbar embedding substrate 21. The male connector 25 on the busbar embedding substrate 21 has a groove-shaped recess 25_1 opening upwardly and a plurality of male terminals 20 integrally extending from the busbars 22 and projecting into the recess 25_1. The male connector 25 constitutes a handlebar cover side connector of this invention and the female connector 44 constitutes a meter unit side connector of this invention.

[0033] Fig.9 shows the female connector 44 on the meter unit 5 side, which has a pair of guide portions 46 projecting to the left and right from the upper end of a flat body portion 45 and having circular guide holes 46_1 formed therein. At its lower end, the body portion 45 is formed with two downward tapering half-split conical guide projections 47, which can engage an outwardly expanding guide surface 25_2 formed at the inlet of the recess 25_1 (see Fig.6). These guide projections 47 and the guide surface 25_2 constitute a centering means.

[0034] As can be seen from Figs.5 and 6, a retaining plate 48 is supported on the upper surface of a pair of bosses 41_4 projecting upwardly from the bottom wall of the housing 41 and is securely held by bolts 49. The female connector 44 has its guide holes 46_1 loosely fitted over the outer circumferences of the bosses 41_4, 41_4 and is sandwiched from above and below between the bottom wall of the housing 41 and the retaining plate 48 so that it will not come out. The diameter of the guide holes 46_1, 46_1 is set slightly larger than that of the bosses 41_4, 41_4 so that the female connector 44 can be moved relative to the housing 41 over a distance corresponding to the difference between these diameters. The body portion 45 of the female connector 44 is loosely fitted in the opening 41_5 formed in the bottom wall of the housing 41 to allow relative movement of the body portion 45 with respect to the housing 41.

[0035] When the meter unit 5 is inserted from above into the meter unit support hole 43 of the rear handlebar cover 1, even if the body portion 45 of the female connector 44 on the meter unit 5 side is deviated from the recess 25_1 of the male connector 25 on the busbar embedding substrate 21 (see a chain line in Fig.6), the tapered guide projections 47 of the female connector 44 are guided along the guide surface 25_2 of the male connector 25, therefore the floatingly supported female connector 44 is automatically centered and joined to the male connector 25. This in turn causes the male terminals 20 of the male connector 25 to be inserted and connected to female terminals 50 of the female connector 44.

[0036] Next, the mounting structure of the starter switch Ss is explained with reference to Figs.10 to 12. The mounting structures of the dimmer switch Sd, indicator switch Sw and horn switch Sh are virtually the same as that of the starter switch Ss.

[0037] The starter switch Ss has a housing 51 made of synthetic resin, an operation knob 53 pivotally supported on the front surface of the housing 51 through a fulcrum pin 52, engagement claws 51_1, 51_1 formed on the upper and lower surfaces of the housing 51 respectively, and a female connector 54 embedded in the housing 51. The female connector 54 is integrally embedded in the housing 51 when the housing 51 is injection-molded, with its female terminals 55 accommodated in the inner space of the housing 51.

[0038] The busbar embedding substrate 21 integrally embedded in the rear handlebar cover 1 is formed with an opening 26 in which the starter switch Ss is fitted. An opening 34 of the rear handlebar cover 1 surrounds the opening 26 on the outer side thereof. In the opening 26 of the busbar embedding substrate 21 is provided a male connector 30 which comprises a plurality of male terminals 56 integrally formed with the busbars 22 and projecting out of the busbar embedding substrate 21. Using a part of the busbars 22 as the male terminals 56 of the male connector 30 as described above, the number of parts of the male connector 30 can be reduced to simplify the structure and minimize the possibility of wire break and poor contact.

[0039] Then, when the starter switch Ss is inserted into the opening 26 of the busbar embedding substrate 21 through the opening 34 of the rear handlebar cover 1, the male terminals 56 of the male connector 30 installed in the opening 26 of the busbar embedding substrate 21 automatically fit into the female terminals 55 of the female connector 54 embedded in the housing 51 of the starter switch Ss, readily completing the electric connection between the starter switch Ss and the busbars 22 in the busbar embedding substrate 21. When the starter switch Ss is fully inserted into the opening 26 of the busbar embedding substrate 21, the engagement claws 51_1, 51_1 provided on the housing 51 engage claw receiving portions 26_1 provided in the opening 26 of the busbar embedding substrate 21 to prevent the starter switch Ss from coming out. Then, a flange 51_2 of the housing 51 of the starter switch Ss fits the opening 34 of the rear handlebar cover 1 to conceal the opening 25 of the busbar embedding substrate 21.

[0040] Because the wiring for the meter unit 5, starter switch Ss, dimmer switch Sd, indicator switch Sw and horn switch Sh, all of which are mounted on the rear handlebar cover 1 of the motorcycle V, is carried out by the busbars 22 embedded in the busbar embedding substrate 21 provided in the rear handlebar cover 1 as described above, not only can the number of parts and manhours required for wiring be reduced substantially but the possibility of short-circuit, wire break and erroneous assembly can also be reduced, compared with a

case where the conventional wiring harness is used. Durability is also improved over what is obtained by the wiring harness. Further, because simply inserting the meter unit 5 into the meter unit support hole 43 of the rear handlebar cover 1 completes an electric connection between the meter unit 5 and the busbars 22 and because simply inserting the starter switch Ss, dimmer switch Sd, indicator switch Sw and horn switch Sh into the openings 26-29 of the busbar embedding substrate 21 completes the electric connection between the switches Ss, Sd, Sw, Sh and the busbars 22, manhours required for assembly can be reduced significantly. Because the meter unit 5 is inserted from outside the rear handlebar cover 1, the handlebar cover can be assembled beforehand, which improves work efficiency. Furthermore, because the female terminals 55 of the female connector 54 are installed inside the switches Ss, Sd, Sw, Sh, the female terminals 55 can be protected against deformation and damage thereof, enhancing the electric contact reliability.

[0041] Next, by referring to Figs.14 and 15 a second embodiment of this invention will be explained. In the second embodiment, constitutional elements alike to those of the first embodiment carry like reference numerals.

[0042] While in the first embodiment the meter unit 5 is inserted downwardly from outside of the rear handlebar cover 1 for assembly, in the second embodiment the meter unit 5 is assembled by inserting it rearwardly from inside the rear handlebar cover 1.

[0043] That is, at the central part of the rear handlebar cover 1 the meter unit support hole 43 is formed in the longitudinal direction and the meter unit 5 is inserted from the inside toward the outside of the rear handlebar cover 1, i.e., from the front of the vehicle toward the rear thereof. At this time, engagement claws 41_2 formed on the lateral sides of the housing 41 engage claw receiving portions 1_8 formed to face the meter unit support hole 43, thereby the meter unit 5 is secured. Because the meter unit 5 is inserted in the longitudinal direction of the vehicle body, the male terminals 20 of the male connector 25 provided on the busbar embedding substrate 21 side and the female terminals 50 of the female connector 44 provided on the meter unit 5 side are arranged in the longitudinal direction of the vehicle.

[0044] Insertion of the meter unit 5 from the inside toward the outside of the rear handlebar cover 1 increases the degree of freedom of design for the meter unit 5. For example, even when the meter unit 5 increases in size due to an addition of constitutional parts, it is only enough to form a window which allows a display portion of the meter unit 5 to be seen from outside of the rear handlebar cover 1 (the rider side), thereby the appearance of the meter unit 5 can be improved.

[0045] Next, a third embodiment of this invention will be described by referring to Fig.16.

[0046] While the starter switch Ss of the first embodiment has its female connector 54 embedded in the housing 51 when the housing 51 is injection-molded, the starter switch Ss of the third embodiment has its female connector 54 mounted in the housing 51 after the housing 51 is injection-molded. That is, the female connector 54 has a pair of engagement claws 54_1, and inserting the female connector 54 into the housing 51 causes the engagement claws 54_1 to engage claw receiving portions 51_3 of the housing 51, thereby the female connector 54 is fixed to the housing 51. The female terminals 55 are embedded in the housing 51 beforehand and, when the female connector 54 is inserted into the housing 51 the female terminals are fitted into the female connector 54.

[0047] Next, by referring to Figs.17 and 18 a fourth embodiment of this invention will be described.

[0048] The starter switch Ss of the fourth embodiment has its female terminals 55 loosely fitted in the female connector 54 embedded in the housing 51, and switch terminals 57 embedded beforehand in the housing 51 are fitted in one end of the respective female terminals 55. When the male connector 30 is connected to the female connector 54, the male terminals 56 integrally extending from the busbars 22 fit the other end of the female terminals 55, thus electrically connecting the starter switch Ss to the busbars 22. Since the female terminals 55 are restricted inside the female connector 54, the female terminals 55 are not pulled out of the female connector 54 together with the male terminals 56 when pulling out the male terminals 56.

[0049] Embodiments of this invention have been described in detail. It should be noted that various design modifications may be made without departing from the spirit and scope of this invention.

[0050] For example, as to the invention described in claims 1, 2 and 4, the conductors are not limited to the busbars 22 but may use a wiring harness. The centering means of claim 4 may be formed in an arbitrary structure. For example, the positional relation between the guide projections 47 and the guide surface 25_2 can be reversed. The switches of the invention described in claim 5 are not limited to the starter switch Ss, dimmer switch Sd, indicator switch Sw and horn switch Sh and may be any other type of switches. Further, the electric parts of this invention described in claims 6 to 9 are not limited to the meter unit 5, starter switch Ss, dimmer switch Sd, indicator switch Sw and horn switch Sh and may be any other type of switches. While in the above embodiments the busbars 22 are formed of metal plate strips, they may have an arbitrary cross section and be formed of a metal bar of circular or rectangular cross section. Although the above embodiments have the busbar embedding substrate 21 supported on the rear handlebar cover 1, it is possible to support the busbar embedding substrate 21 at any part of the handlebar cover. Further, it is also possible to reverse the positional relation between the female connector 44 and the male connector 25.

Claims

1. A wiring structure for a motorcycle to electrically connect a meter (5) supported on a handlebar cover (1) of the motorcycle to conductors (22) arranged inside the handlebar cover (1), wherein a handlebar cover side connector (25) of the wiring structure, connected to the conductors (22), is provided inside a meter support hole (43) formed in the handlebar cover (1) and the meter (5) is inserted into the meter support hole (43) thereby to connect a meter side connector (44) of the wiring structure, provided in the meter (5), to the handlebar cover side connector (25).

2. A wiring structure for a motorcycle according to claim 1, wherein engagement claws (41_1, 41_2, 41_3) are provided on one of the meter (5) and the handlebar cover (1) and claw receiving portions (4_1, 1_8, 1_9) are provided on the other of the handlebar cover (1) and the meter (5), and said engagement claws (41_1, 41_2, 41_3) and said claw receiving portions (4_1, 1_8, 1_9) are engaged together to prevent the meter (5) from coming out the meter support hole (43) of the handlebar cover (1).

3. A wiring structure for a motorcycle according to claim 1 or 2, wherein the conductors (22) are constructed of busbars made of a metal plate or a metal bar embedded in a synthetic resin (21).

4. A wiring structure for a motorcycle according to any one of claims 1 to 3, further comprising a centering means (47, 25_2) to floatingly support the meter side connector (44) with respect to the meter (5) and to center the meter side connector (44) and the handlebar cover side connector (25) with respect to each other by said centering means (47, 25_2) being provided between both the connectors (44, 25).

5. A wiring structure for a motorcycle to electrically connect a switch (S_s) supported on a handlebar cover (1) of the motorcycle to conductors (22) arranged inside the handlebar cover (1), wherein the conductors (22) are comprised of busbars made of a metal plate or a metal bar embedded in a busbar embedding substrate of a synthetic resin (21), tip ends (56) of the busbars (22) are projected from the busbar embedding substrate (21) toward an opening (26) formed in the handlebar cover (1) to form busbar side connector terminals of the wiring structure, and switch side connector terminals (55) of the wiring structure, provided inside the switch (S_s) , are inserted into the opening (26) to connect the busbar side connector terminals (56) and the switch side connector terminals (55).

6. A wiring method for a motorcycle to supply electricity to an electric part (5, S_s) supported on a handlebar cover (1) of the motorcycle, comprising:

   a step of injection-molding a busbar embedding substrate (21) of a synthetic resin having a plurality of busbars (22) made of a metal plate or a metal bar embedded therein, the busbars (22) having tip ends (20, 56) which project from the busbar embedding substrate (21) to form busbar side connector terminals;
   a step of injection-molding a handlebar cover (1) made of a synthetic resin to enclose at least a part of the busbar embedding substrate (21), the handlebar cover (1) having an opening (26) towards which the busbar side connector terminals (22) project; and
   a step of mounting the electric part (5, S_s) on the handlebar cover (1) the electric part (5, S_s) having electric part side connector terminals (50, 55) disposed so that movement of the electric part (5, S_s) into position on the handlebar cover (1) electrically connects the electric part side connector terminals (50, 55) to the busbar side connector terminals (20, 56).

7. A wiring method for a motorcycle according to claim 6, wherein, during the step of injection-molding the busbar embedding substrate (21), the plurality of busbars (22) are connected together through connecting portions (23), the connecting portions (23) being cut and removed after injection-molding on the busbar embedding substrate (21).

8. A wiring method for a motorcycle according to claim 7, wherein the busbar embedding substrate (21) has an opening (21_1-21_{10}) which the connecting portions (23) face, the busbars (22) are held through the opening (21_1-21_{10}) when the busbar embedding substrate (21) is injection-molded, and after the injection molding of the busbar embedding substrate (21), the connecting portions (23) are cut and removed through the opening (21_1-21_{10}).

9. A wiring method for a motorcycle according to claim 8, wherein when the handlebar cover (1) is injection-molded, the opening (21_1-21_{10}) of the busbar embedding substrate (21) is covered with a synthetic resin to fill the synthetic resin into the opening (21_1-21_{10}).

10. A handlebar cover (1) for a motorcycle, having an electrical component (5, S_s) being mounted in an aperture (26, 43) in the handlebar cover (1) and being connected to conductors (22) accommodated within the handlebar cover (1), **characterized in that** the electrical component (5, S_s) is connected to the conductors (22) by a connector having a first part (25, 56) fixed to the handlebar cover (1) and a

second part (44, 54) fixed to the handlebar cover (1) and a second part (44, 54) fixed to the electrical component (5, S_s), whereby the two parts (25, 56; 44, 54) of the connector are engaged with one another by movement of the electrical component (5, S_s) into the aperture (26, 43).

Patentansprüche

1. Verkabelungsstruktur für ein Motorrad, um ein an einer Lenkerabdeckung (1) des Motorrads gehaltenes Instrument (5) elektrisch mit Leitern (22) zu verbinden, die im Inneren der Lenkerabdeckung (1) angeordnet sind, wobei ein lenkerabdeckungsseitiger Verbinder (25) der Verkabelungsstruktur, der mit den Leitern (22) verbunden ist, im Inneren einer in der Lenkerabdeckung (1) gebildeten Instrument-Halteöffnung (43) vorgesehen und das Instrument (5) in die Instrument-Halteöffnung (43) eingesetzt ist, um dadurch einen in dem Instrument (5) vorgesehenen instrumentseitigen Verbinder (44) der Verkabelungsstruktur mit dem lenkerabdeckungsseitigen Verbinder (25) zu verbinden.

2. Verkabelungsstruktur für ein Motorrad gemäß Anspruch 1, wobei Eingriffsklauen (41_1, 41_2, 41_3) an einem von dem Instrument (5) und der Lenkerabdeckung (1) und Klauenaufnahmebereiche (4_1, 1_8, 1_9) an dem jeweils anderen von Lenkerabdeckung (1) und Instrument (5) vorgesehen sind und wobei die Eingriffsklauen (41_1, 41_2, 41_3) und die Klauenaufnahmebereiche (4_1, 1_8, 1_9) miteinander in Eingriff gebracht sind, um zu verhindern, dass das Instrument (5) aus der Instrument-Halteöffnung (43) der Lenkerabdeckung (1) herausgelangt.

3. Verkabelungsstruktur für ein Motorrad gemäß Anspruch 1 oder 2, wobei die Leiter (22) aus Sammelschienen gebildet sind, die aus einer in einem synthetischen Harz (21) eingebetteten Metallplatte oder einem Metallstab hergestellt sind.

4. Verkabelungsstruktur für ein Motorrad gemäß einem der Ansprüche 1 bis 3, ferner umfassend ein Zentriermittel (47, 25_2), um den instrumentseitigen Verbinder (44) mit Bezug auf das Instrument (5) schwimmend zu halten und um den instrumentseitigen Verbinder (44) und den lenkerabdeckungsseitigen Verbinder (25) mit Bezug aufeinander zu zentrieren, indem das Zentriermittel (47, 25_2) zwischen beiden Verbindern (44, 25) vorgesehen ist.

5. Verkabelungsstruktur für ein Motorrad, um einen an einer Lenkerabdeckung (1) des Motorrads gehaltenen Schalter (S_s) elektrisch mit Leitern (22) zu verbinden, die im Inneren der Lenkerabdeckung (1) angeordnet sind, wobei die Leiter (22) aus Sammelschienen bestehen, die aus einer Metallplatte oder einem Metallstab, die/der in einem Sammelschienen-Einbettungssubstrat aus einem synthetischen Harz (21) eingebettet sind, hergestellt sind, wobei die vorderen Enden (56) der Sammelschienen (22) aus dem Sammelschienen-Einbettungssubstrat (21) in Richtung auf eine in der Lenkerabdeckung (1) gebildete Öffnung (26) hervorstehen, um sammelschienenseitige Verbinderanschlüsse der Verkabelungsstruktur zu bilden, und wobei im Inneren des Schalters (S_s) vorgesehene schalterseitige Verbinderanschlüsse (55) der Verkabelungsstruktur in die Öffnung (26) eingesetzt sind, um die sammelschienenseitigen Verbinderanschlüsse (56) und die schalterseitigen Verbinderanschlüsse (55) zu verbinden.

6. Verkabelungsverfahren für ein Motorrad, um einem an einer Lenkerabdeckung (1) des Motorrads gehaltenen elektrischen Teil (5; S_s) elektrischen Strom zuzuführen, umfassend:

   - einen Schritt des Spritzgießens eines Sammelschienen-Einbettungssubstrats (21) aus einem synthetischen Harz, in dem eine Mehrzahl von Sammelschienen (22), die aus einer Metallplatte oder einem Metallstab hergestellt sind, eingebettet werden, wobei die Sammelschienen (22) vordere Enden (20, 56) aufweisen, die aus dem Sammelschienen-Einbettungssubstrat (21) hervorstehen, um sammelschienenseitige Verbinderanschlüsse zu bilden;
   - einen Schritt des Spritzgießens einer aus einem synthetischen Harz hergestellten Lenkerabdeckung (1) zum Einschluss zumindest eines Teils des Sammelschienen-Einbettungssubstrats (21), wobei die Lenkerabdeckung (1) eine Öffnung (26) hat und die sammelschienenseitigen Verbinderanschlüsse (22) in Richtung auf diese Öffnung hervorstehen; und
   - einen Schritt des Montierens des elektrischen Teils (5, S_s) an der Lenkerabdeckung (1), wobei das elektrische Teil (5, S_s) seinerseits Verbinderanschlüsse (50, 55) hat, die derart angeordnet sind, dass eine Bewegung des elektrischen Teils (5, S_s) in Position an der Lenkerabdekkung (1) die Verbinderanschlüsse (50, 55) auf der Seite des elektrischen Teils mit den sammelschienenseitigen Verbinderanschlüssen (20, 56) elektrisch verbindet.

7. Verkabelungsverfahren für ein Motorrad gemäß Anspruch 6, wobei während des Schritts des Spritzgießens des Sammelschienen-Einbettungssubstrats (21) die Mehrzahl von Sammelschienen (22) durch Verbindungsbereiche (23) miteinander verbunden wird, wobei die Verbindungsbereiche (23) nach dem Spritzgießen an dem Sammelschienen-

Einbettungssubstrat (21) abgeschnitten und entfernt werden.

8. Verkabelungsverfahren für ein Motorrad gemäß Anspruch 7, wobei das Sammetschienen-Einbettungssubstrat 21 eine Öffnung (21_1-21_{10}) aufweist, der die Verbindungsbereiche (23) zugekehrt sind, wobei die Sammelschienen (22) durch die Öffnung (21_1-21_{10}) gehalten werden, wenn das Sammelschienen-Einbettungssubstrat (21) spritzgegossen wird, und wobei die Verbindungsbereiche (23) nach dem Spritzgießen des Sammelschienen-Einbettungssubstrats (21) abgeschnitten und durch Öffnung (21_1-21_{10}) entfernt werden.

9. Verkabelungsverfahren für ein Motorrad gemäß Anspruch 8, wobei, wenn die Lenkerabdeckung (1) spritzgegossen wird, die Öffnung (21_1-21_{10}) des Sammelschienen-Einbettungssubstrats (21) mit einem synthetischen Harz bedeckt wird, um das synthetische Harz in die Öffnung (21_1-21_{10}) zu füllen.

10. Lenkerabdeckung (1) für ein Motorrad, die ein elektrisches Bauteil (5, S_s) aufweist, das in einer Öffnung (26, 43) der Lenkerabdeckung (1) montiert und mit Leitern (22) verbunden ist, die in der Lenkerabdeckung (1) untergebracht sind, **dadurch gekennzeichnet, dass** das elektrische Bauteil (5, S_s) durch einen Verbinder, der ein an der Lenkerabdekkung (1) befestigtes erstes Teil (25, 56) und ein an der Lenkerabdeckung (1) befestigtes zweites Teil (44, 54) und ein an dem elektrischen Bauteil (5, S_s) befestigtes zweites Teil (44, 54) aufweist, mit den Leitern (22) verbunden ist, wodurch die beiden Teile (25, 56; 44, 54) des Verbinders durch ein Bewegen des elektrischen Bauteils (5, S_s) in die Öffnung (26, 43) miteinander in Eingriff gebracht werden.

Revendications

1. Réseau de câblage pour motocycle pour connecter électriquement un compteur (5) supporté par un couvercle (1) de guidon du motocycle à des conducteurs (22) disposés à l'intérieur du couvercle (1) du guidon, dans lequel un connecteur latéral (25) du couvercle de guidon du réseau de câblage connecté aux conducteurs (22) est prévu à l'intérieur d'une ouverture (43) de support du compteur ménagée dans le couvercle (1) de guidon, et dans lequel le compteur (5) est inséré dans l'ouverture (43) de support du compteur, connectant ainsi un connecteur latéral (44) du compteur du réseau de câblage, prévu dans le compteur (5) au connecteur latéral (25) du couvercle de guidon.

2. Réseau de câblage pour motocycle selon la revendication 1, dans lequel des griffes de retenue (41_1, 41_2, 41_3) sont prévues sur le compteur (5) ou le couvercle (1) de guidon, des parties (4_1, 1_8, 1_9) réceptrices de griffes étant prévues sur l'autre élément parmi le couvercle (1) de guidon et le compteur (5), lesdites griffes de retenue (41_1, 41_2, 41_3) et lesdites parties (4_1, 1_8, 1_9) réceptrices de griffes étant en prise pour éviter la sortie du compteur (5) hors de l'ouverture de support (43) du couvercle (1) de guidon.

3. Réseau de câblage pour motocycle selon la revendication 1 ou 2, dans lequel les conducteurs (22) sont constitués par des barres de bus en plaque métallique ou en barre métallique enrobées dans une résine synthétique (21).

4. Réseau de câblage pour motocycle selon l'une quelconque des revendications 1 à 3, comprenant en outre un moyen de centrage (47, 25_2) pour supporter de manière flottante le connecteur latéral (44) du compteur par rapport au compteur (5) et pour centrer le connecteur latéral (44) du compteur et le connecteur latéral (25) du couvercle de guidon l'un par rapport à l'autre par ledit moyen de centrage (47, 25_2) prévu entre les deux connecteurs (44, 25).

5. Réseau de câblage pour motocycle pour connecter électriquement un commutateur (S_s) supporté par un couvercle (1) de guidon du motocycle à des conducteurs (22) disposés à l'intérieur du couvercle (1) de guidon, dans lequel les conducteurs (22) comprennent des barres de bus en plaque métallique ou en barre métallique enrobées dans un substrat d'enrobage en résine synthétique (21), des extrémités (56) d'embouts des barres de bus (22) étant en saillie à partir du substrat d'enrobage (21) vers un orifice (26) ménagé dans le couvercle (1) de guidon pour constituer des bornes de connecteur latéral du réseau de câblage, et dans lequel des bornes (55) de connecteur latéral du commutateur du réseau de câblage, prévues à l'intérieur du commutateur (S_s), sont insérées dans l'orifice (26) pour connecter les bornes (56) du connecteur latéral des barres de bus et les bornes (55) du connecteur latéral du commutateur.

6. Procédé de câblage pour un motocycle pour alimenter en électricité une partie électrique (5, S_s) supportée par un couvercle (1) de guidon du motocycle, comprenant :

une étape qui consiste à mouler par injection un substrat d'enrobage (21) de barres de bus en résine synthétique, comprenant une pluralité de barres (22) de bus en plaque métallique ou en barre métallique enrobées dans celui-ci, les barres (22) de bus ayant des extrémités (20, 56) d'embouts en saillie depuis le substrat (21)

d'enrobage des barres de bus pour former des bornes du connecteur latéral des barres de bus ;

une étape qui consiste à mouler par injection un couvercle (1) de guidon en résine synthétique pour enfermer au moins une partie du substrat (21) d'enrobage des barres de bus, le couvercle (1) de guidon ayant un orifice (26) vers lequel les bornes (22) du connecteur latéral de barres de bus sont en saillie ; et

une étape qui consiste à monter la partie électrique (5, S_s) sur le couvercle (1) de guidon, la partie électrique (5, S_s) ayant des bornes (50, 55) de connecteur latéral de la partie électrique disposées de manière à ce que le déplacement de la partie électrique (5, S_s) vers sa position sur le couvercle (1) de guidon connecte électriquement les bornes (50, 55) du connecteur latéral de la partie électrique aux bornes (20, 56) du connecteur latéral des barres de bus.

7. Procédé de câblage pour motocycle selon la revendication 6, dans lequel au cours de l'étape de moulage par injection du substrat (21) d'enrobage des barres de bus, la pluralité des barres (22) de bus sont connectées ensemble par des portions de connexion (23), les portions de connexion (23) étant sectionnées et retirées après le moulage par injection du substrat (21) d'enrobage de barres de bus.

8. Procédé de câblage pour motocycle selon la revendication 7, dans lequel le substrat (21) d'enrobage de barres de bus comprend une ouverture (21_1-21_{10}) auxquelles les portions de connexion (23) font face, les barres de bus étant maintenues à travers l'ouverture (21_1-21_{10}) lorsque le substrat (21) d'enrobage des barres de bus est moulé par injection, et, après le moulage par injection du substrat (21) d'enrobage des barres de bus, les portions de connexion (23) sont sectionnées et retirées à travers l'ouverture (21_1-21_{10}).

9. Procédé de câblage pour motocycle selon la revendication 8, dans lequel lorsque le couvercle (1) de guidon est moulé par injection, l'ouverture (21_1-21_{10}) du substrat (21) d'enrobage des barres de bus est recouverte de résine synthétique pour remplir l'ouverture (21_1-21_{10}) de résine synthétique.

10. Couvercle (1) de guidon de motocycle, ayant un composant électrique (5, S_8) monté dans une ouverture (26, 43) ménagée dans le couvercle (1) de guidon et connectée à des conducteurs (22) logés à l'intérieur du couvercle (1) de guidon, **caractérisé en ce que** le composant électrique (5, S_s) est connecté aux conducteurs (22) par un connecteur ayant une première partie (25, 56) fixée au couvercle (1) de guidon, et une seconde partie (44, 54) fixée au couvercle (1) de guidon, la seconde partie (44, 54) étant fixée au composant électrique (5, S_s) moyennant quoi les deux parties (25, 56 ; 44, 54) de connecteur sont mises en prise l'une avec l'autre par le mouvement du composant électrique (5, S_s) dans l'ouverture (26, 43).

FIG.1

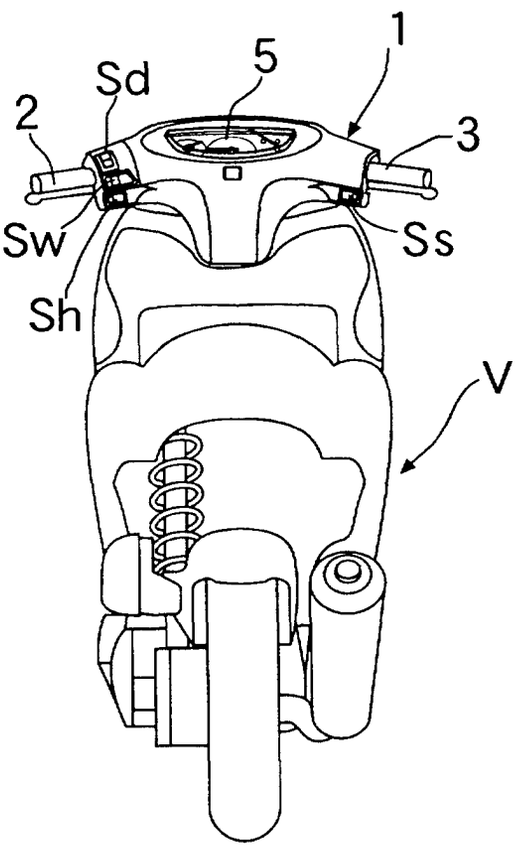

FIG.2

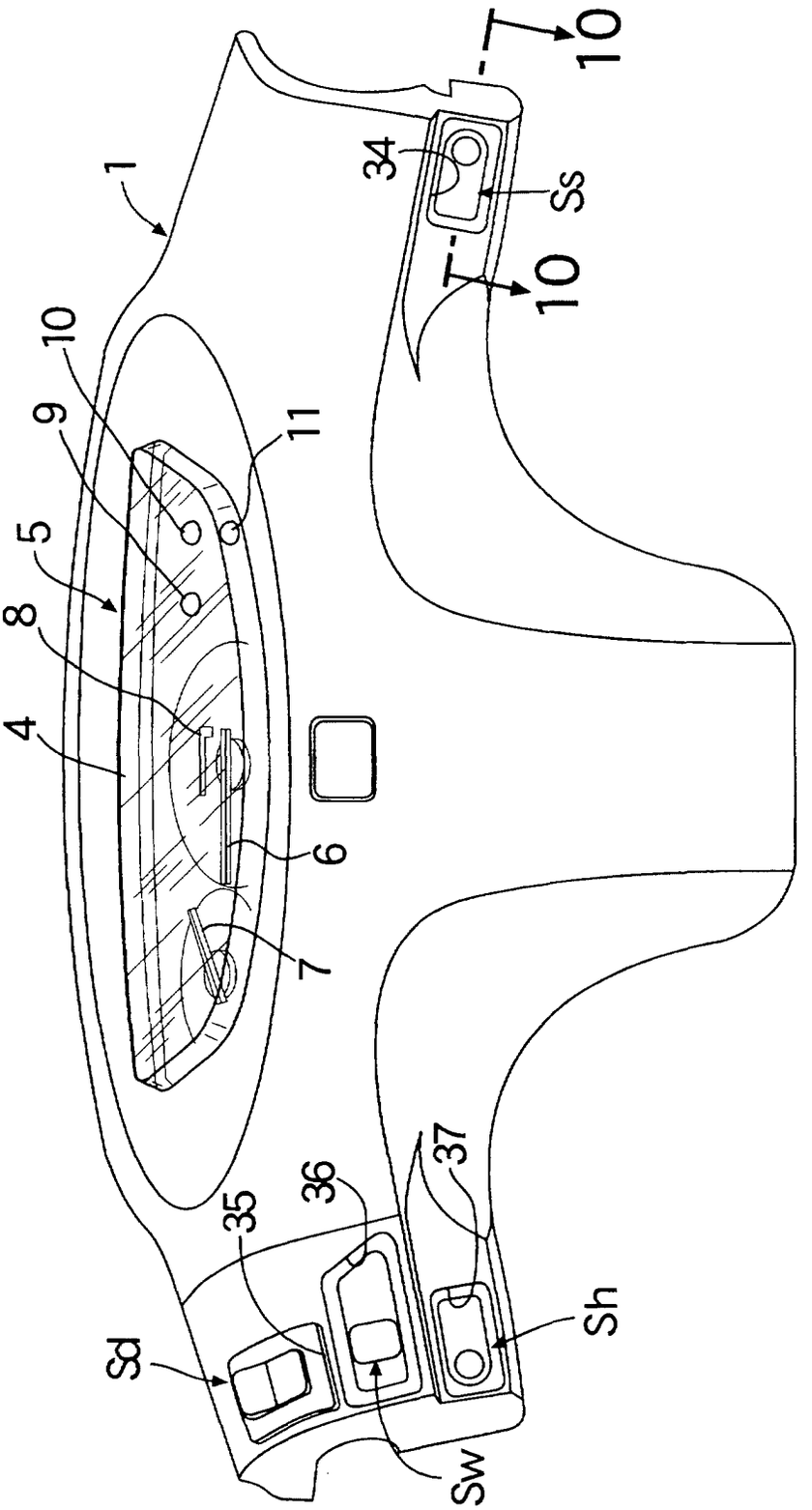

FIG.3

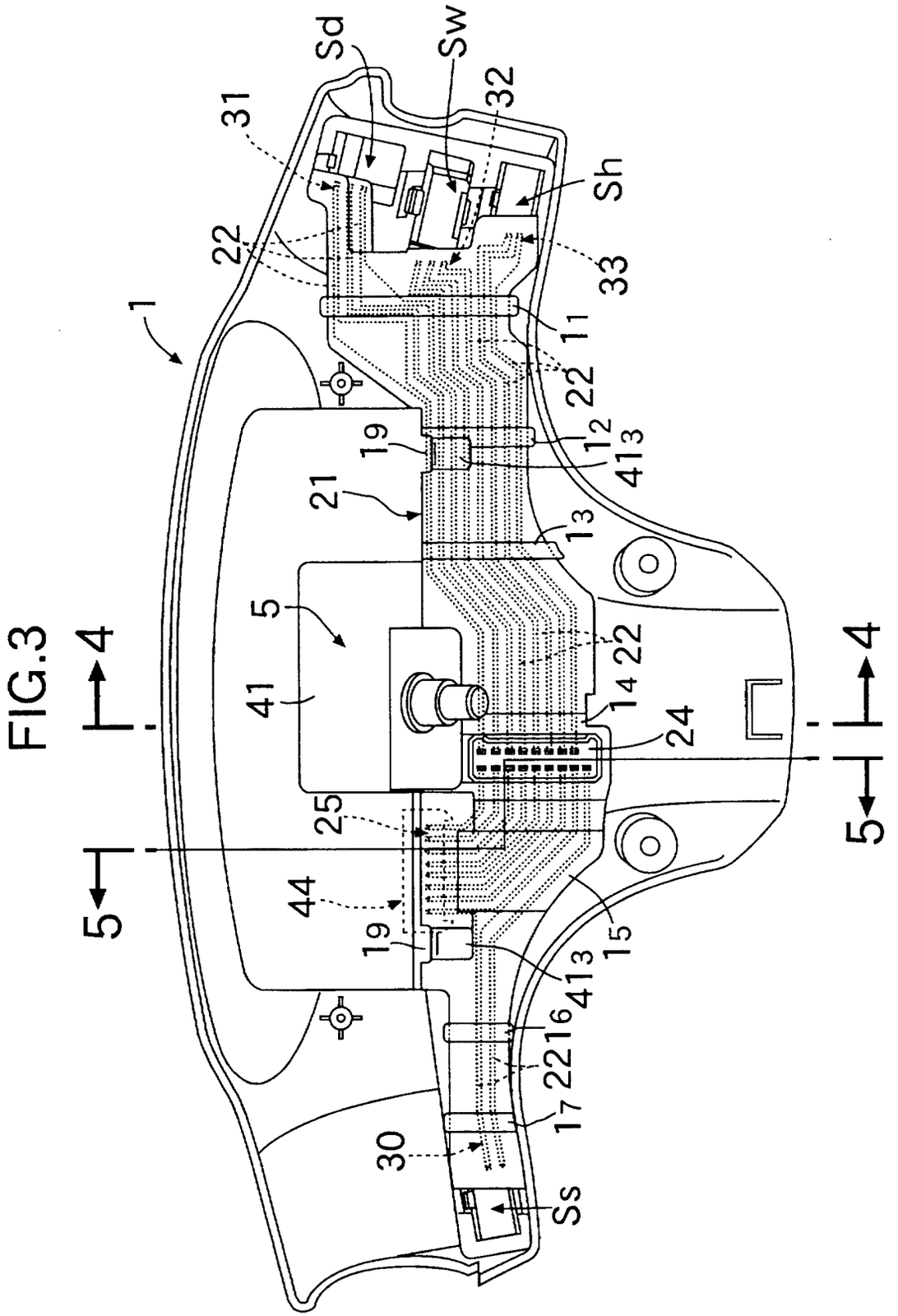
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FIG.4

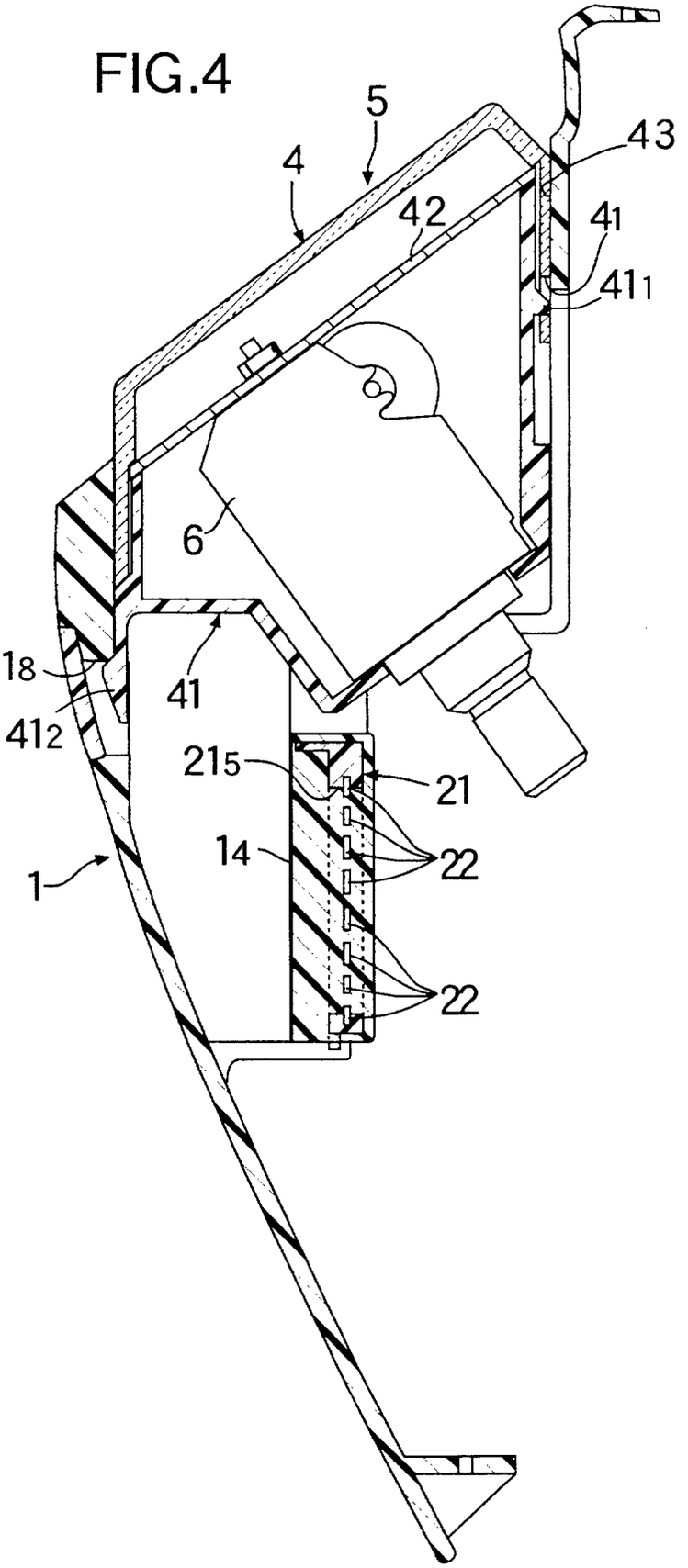

FIG.5

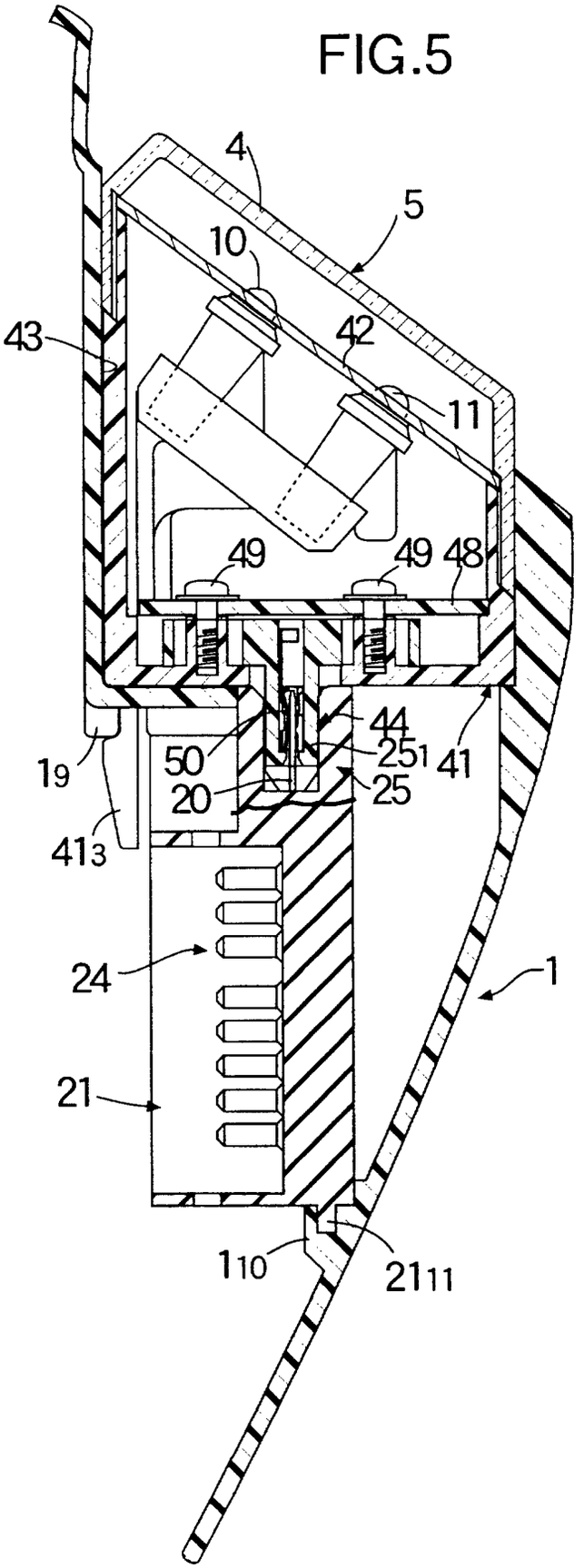

FIG.6

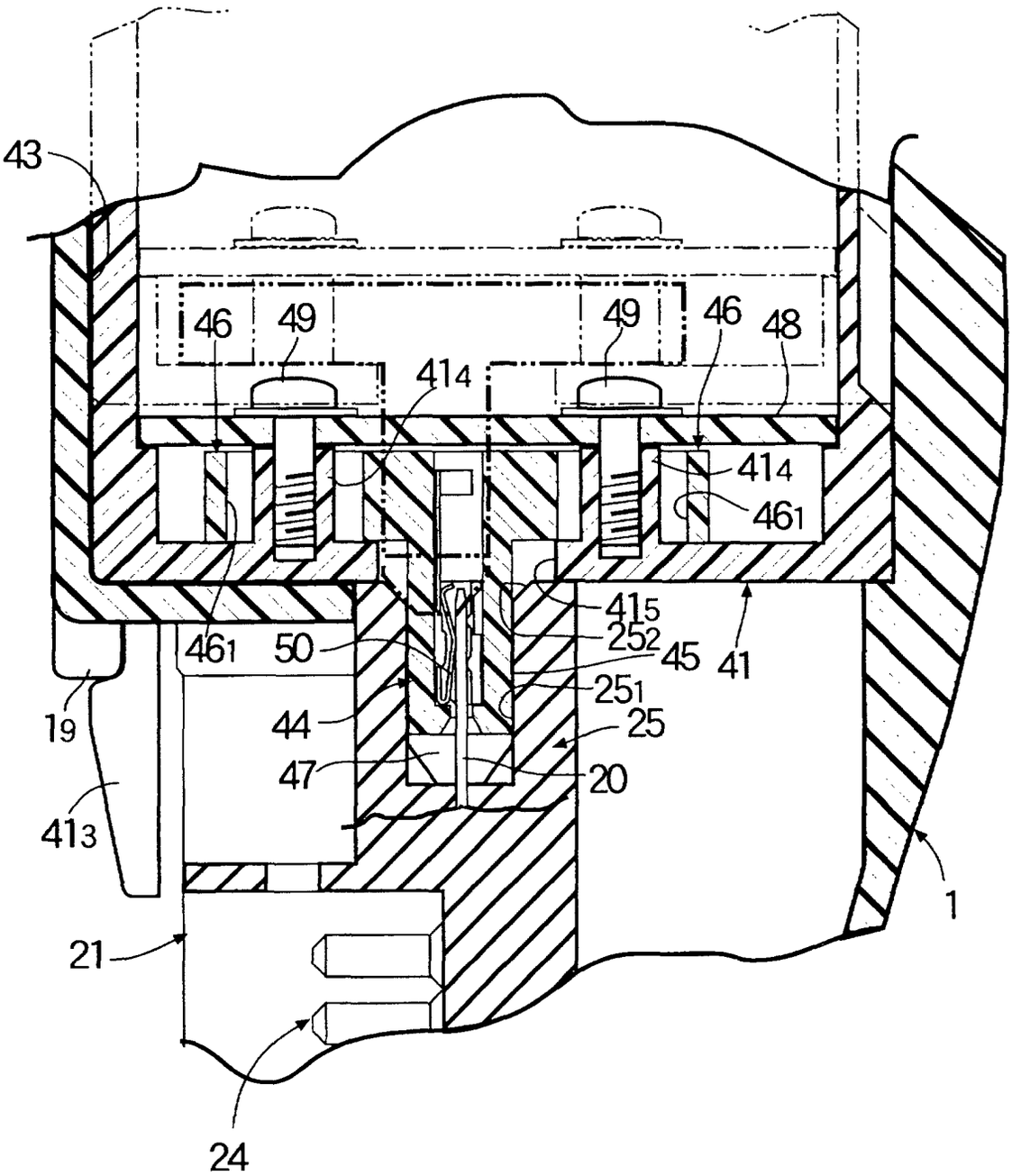
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FIG.7

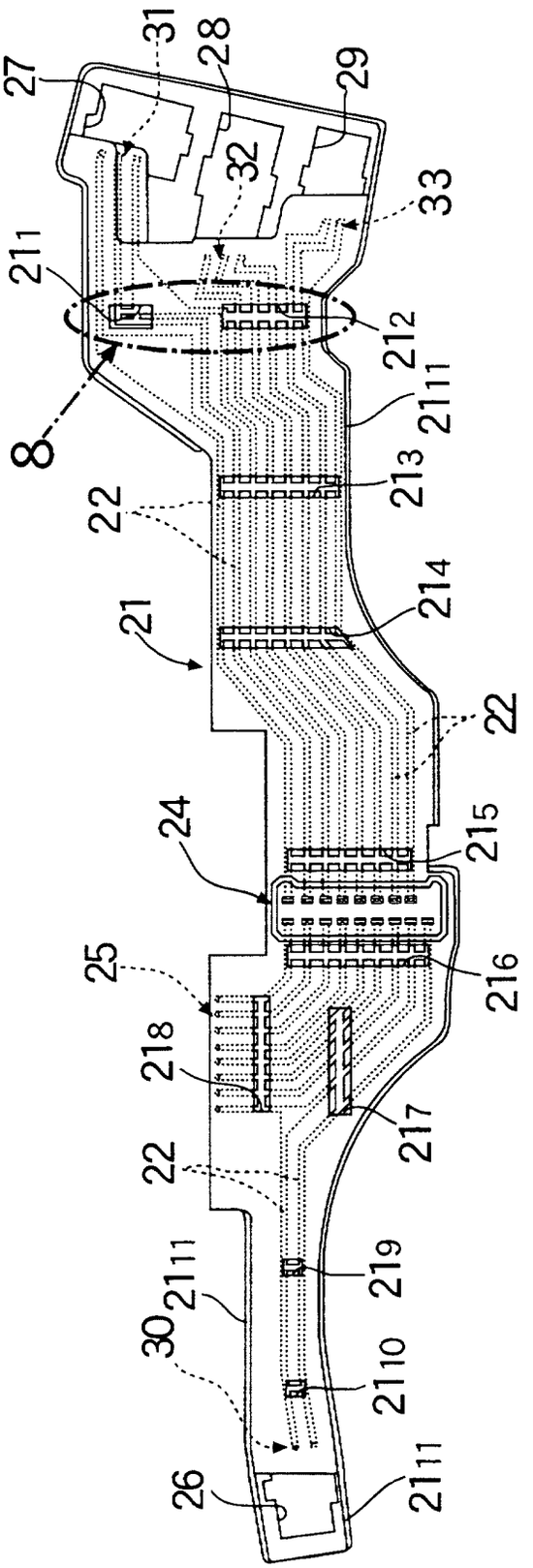
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FIG.8B

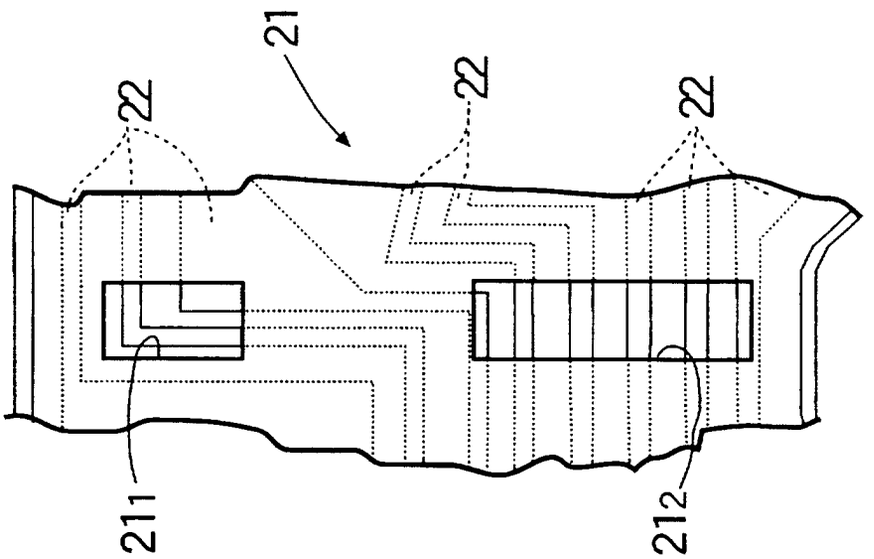

FIG.8A

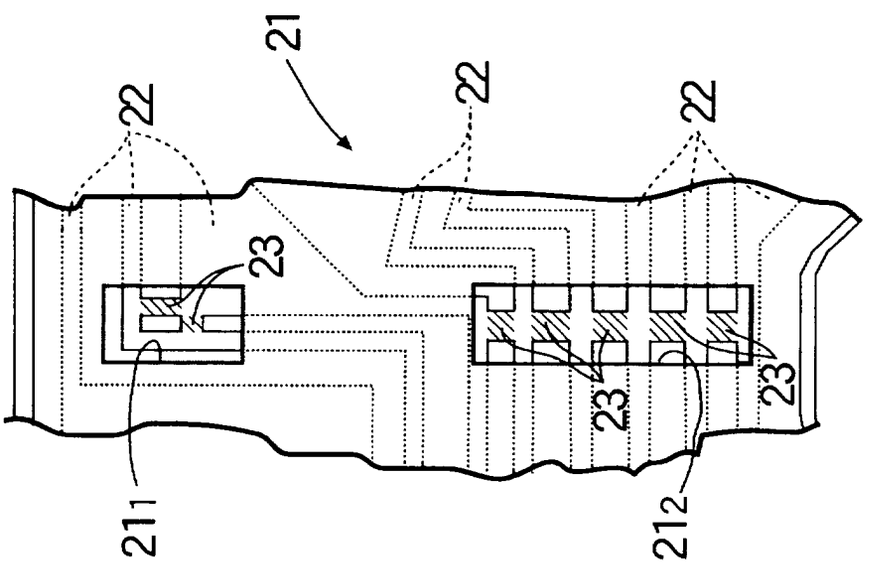

FIG.9

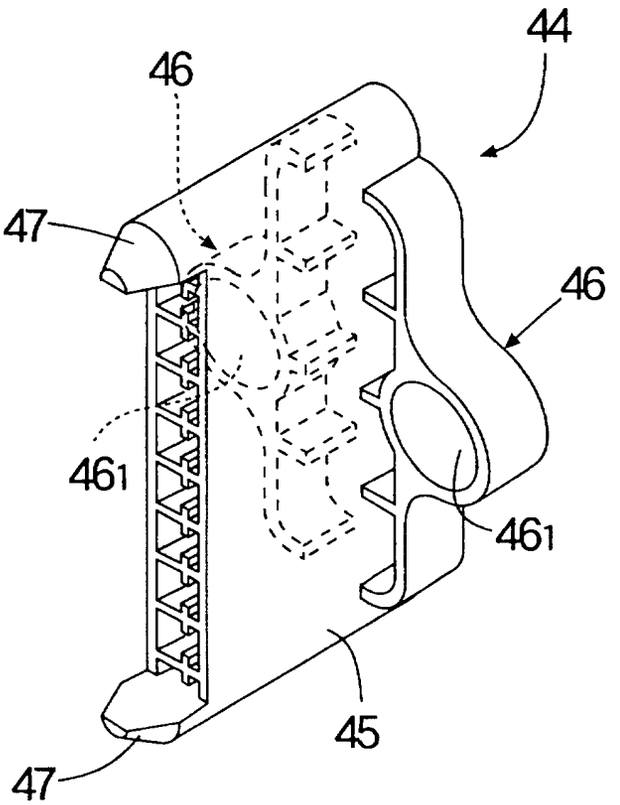

FIG.10

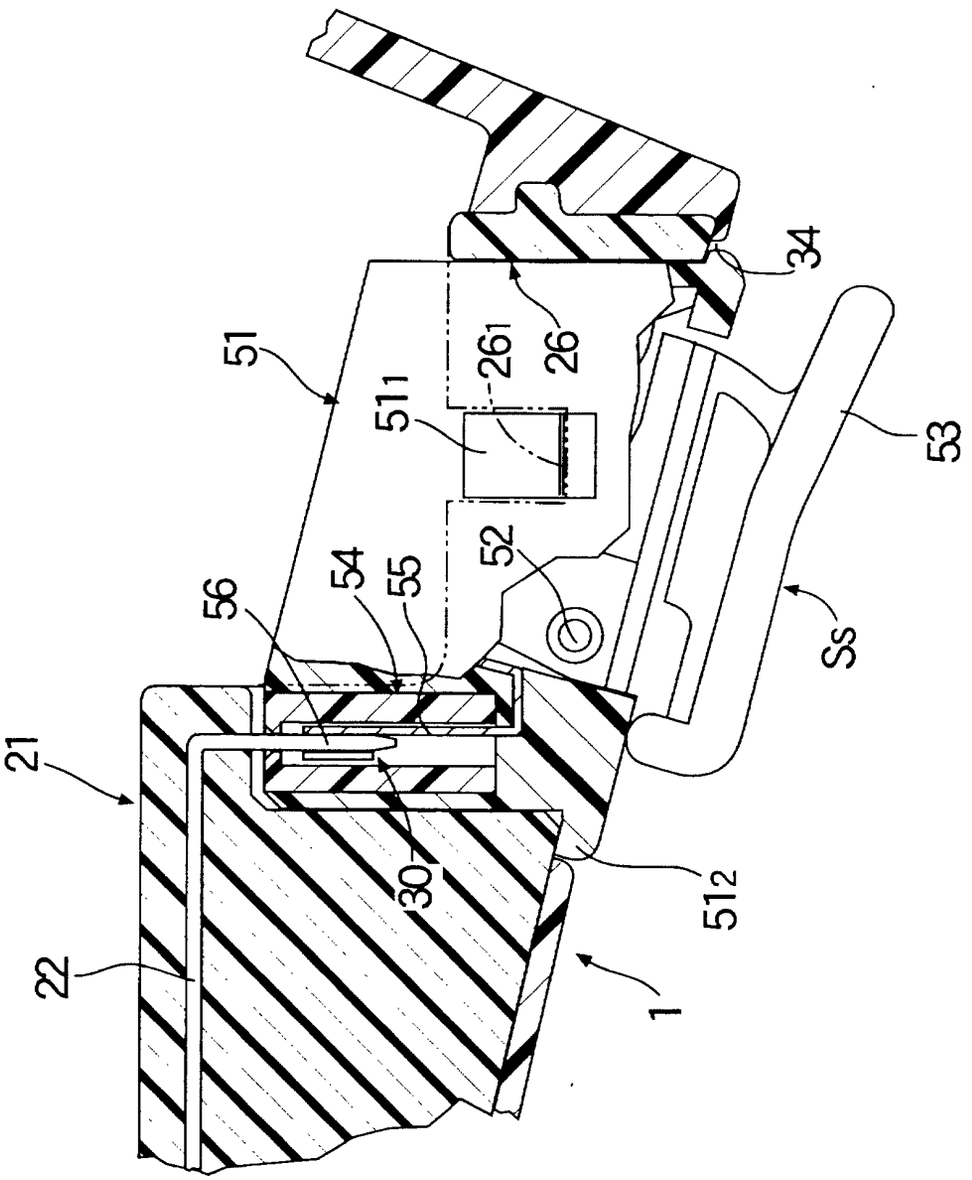

FIG.11

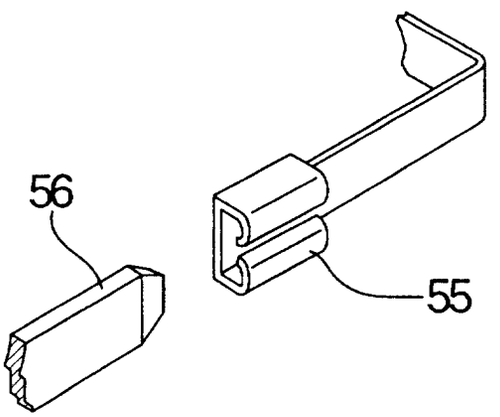

FIG.12

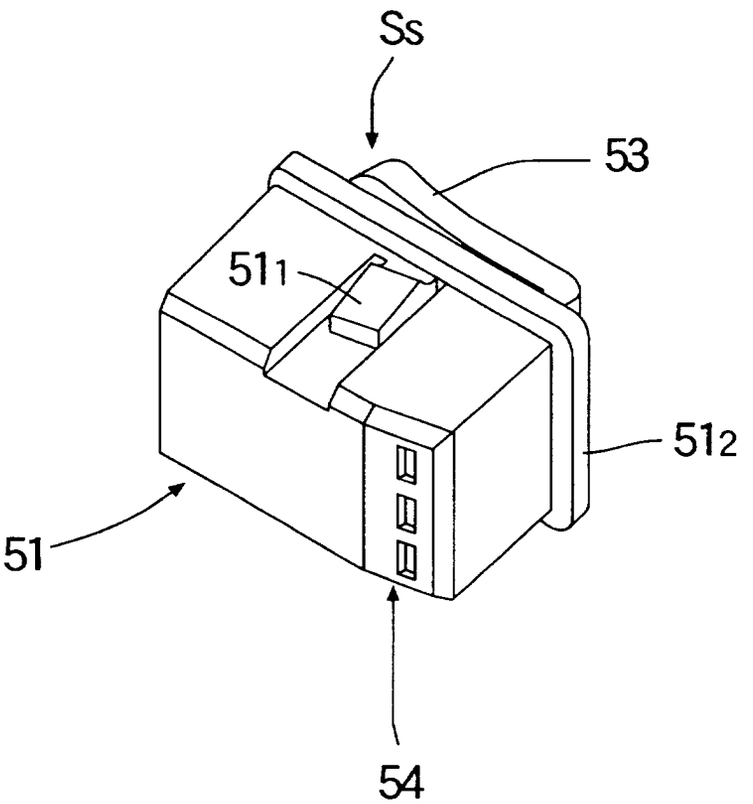

FIG.13

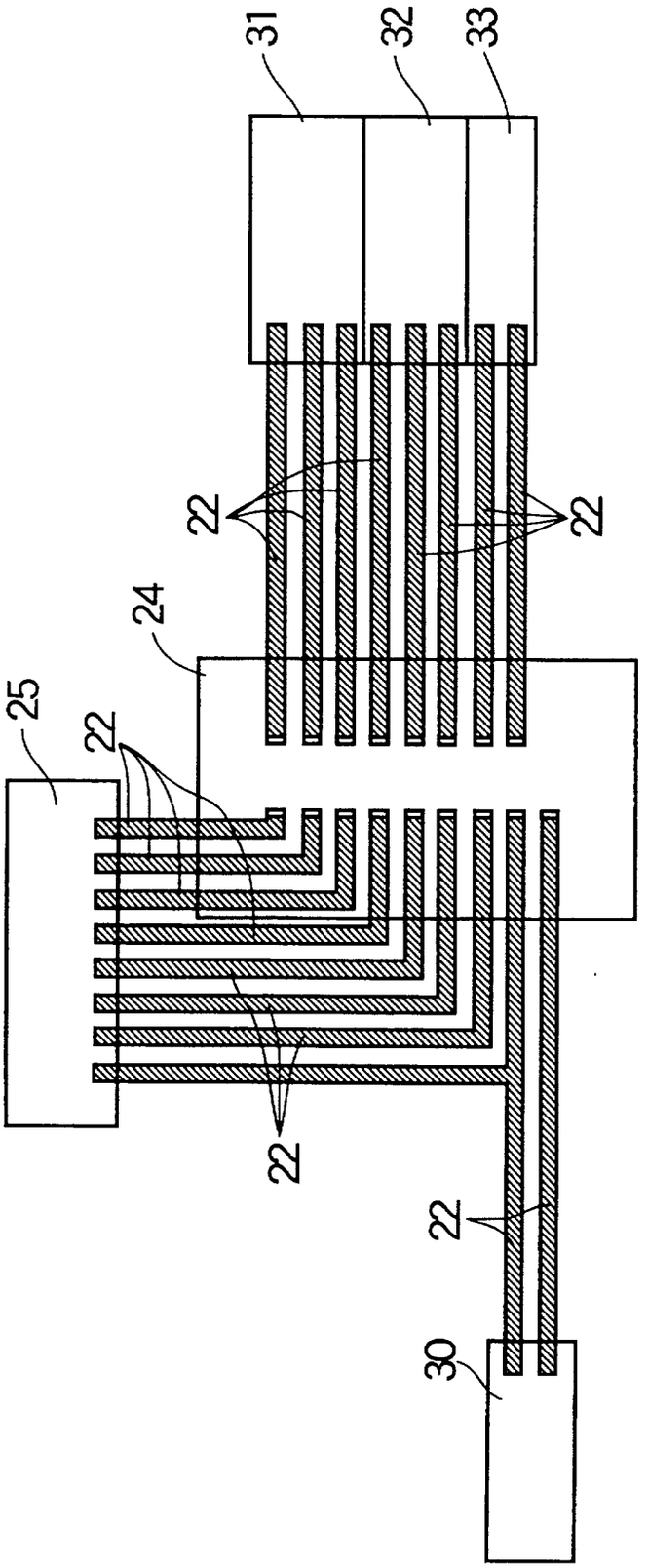

FIG.14

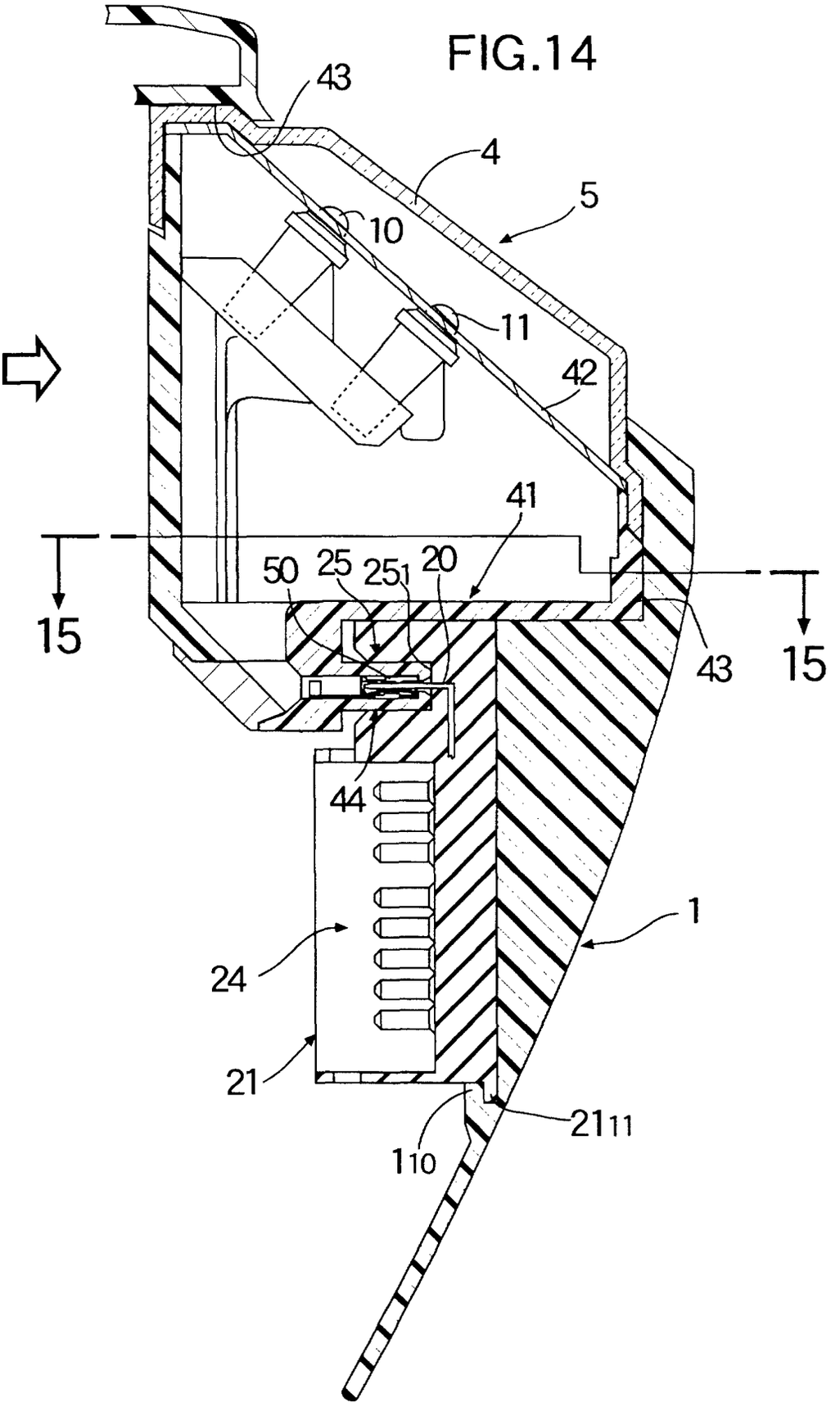

FIG.15

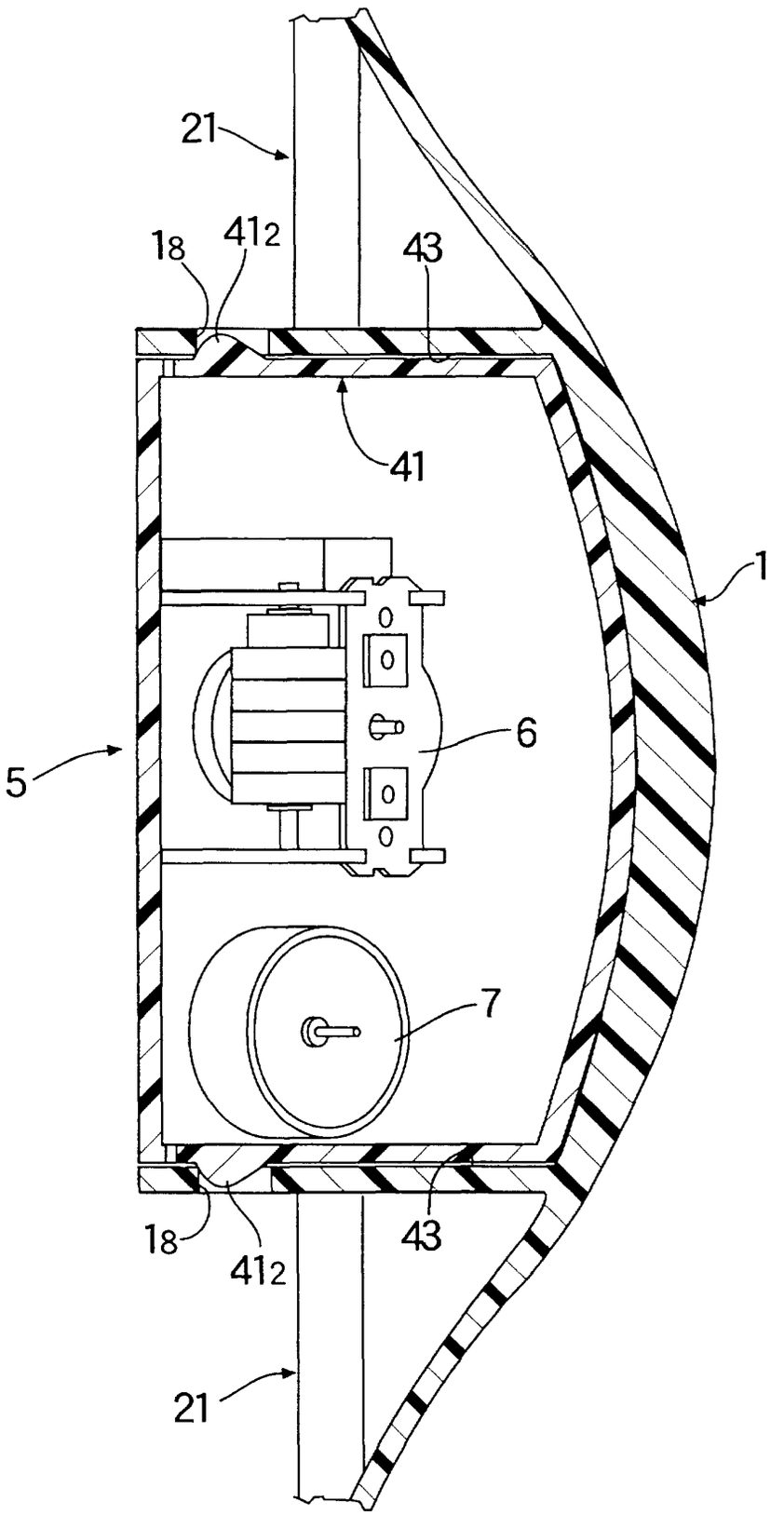

FIG.16

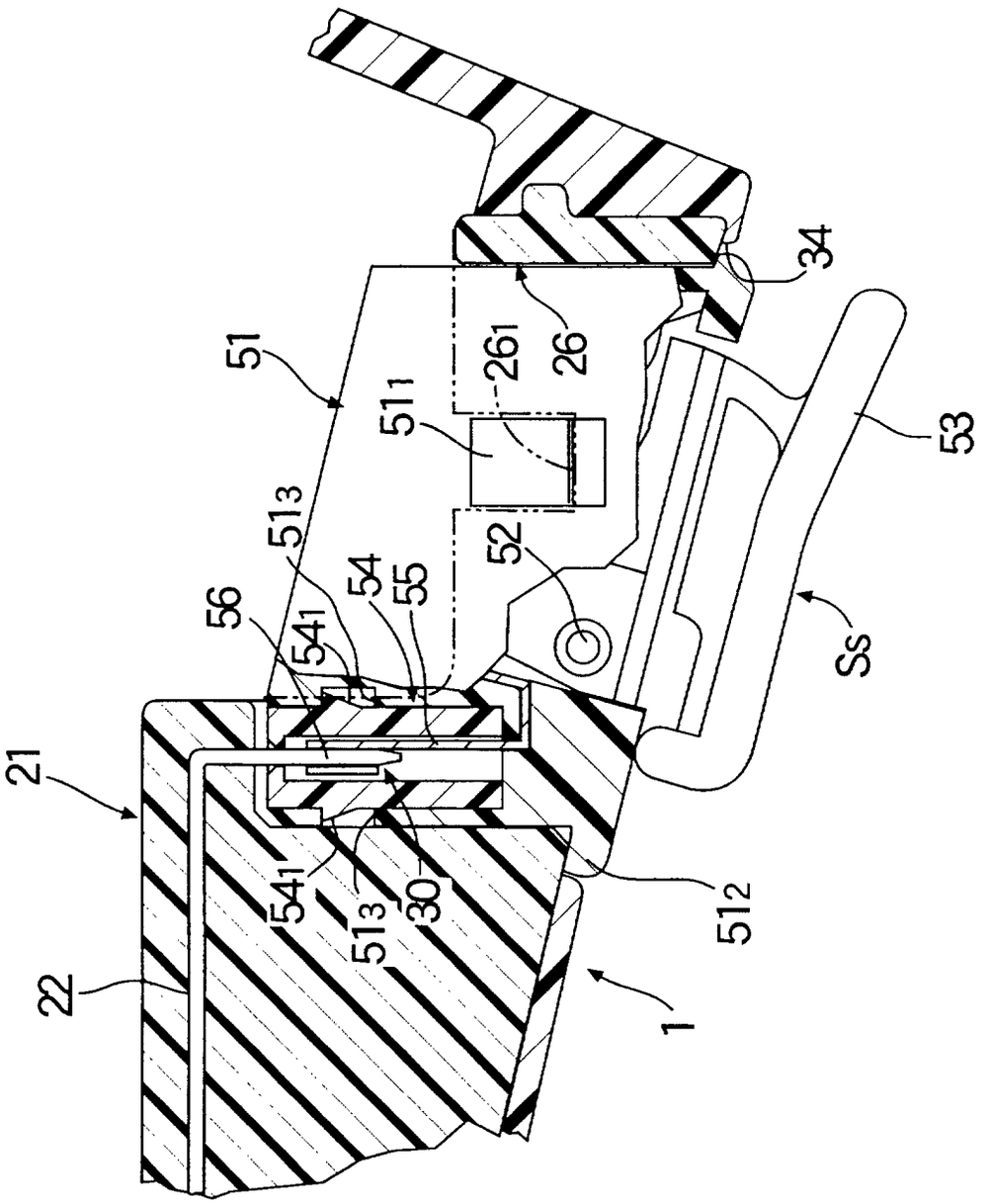

FIG.17

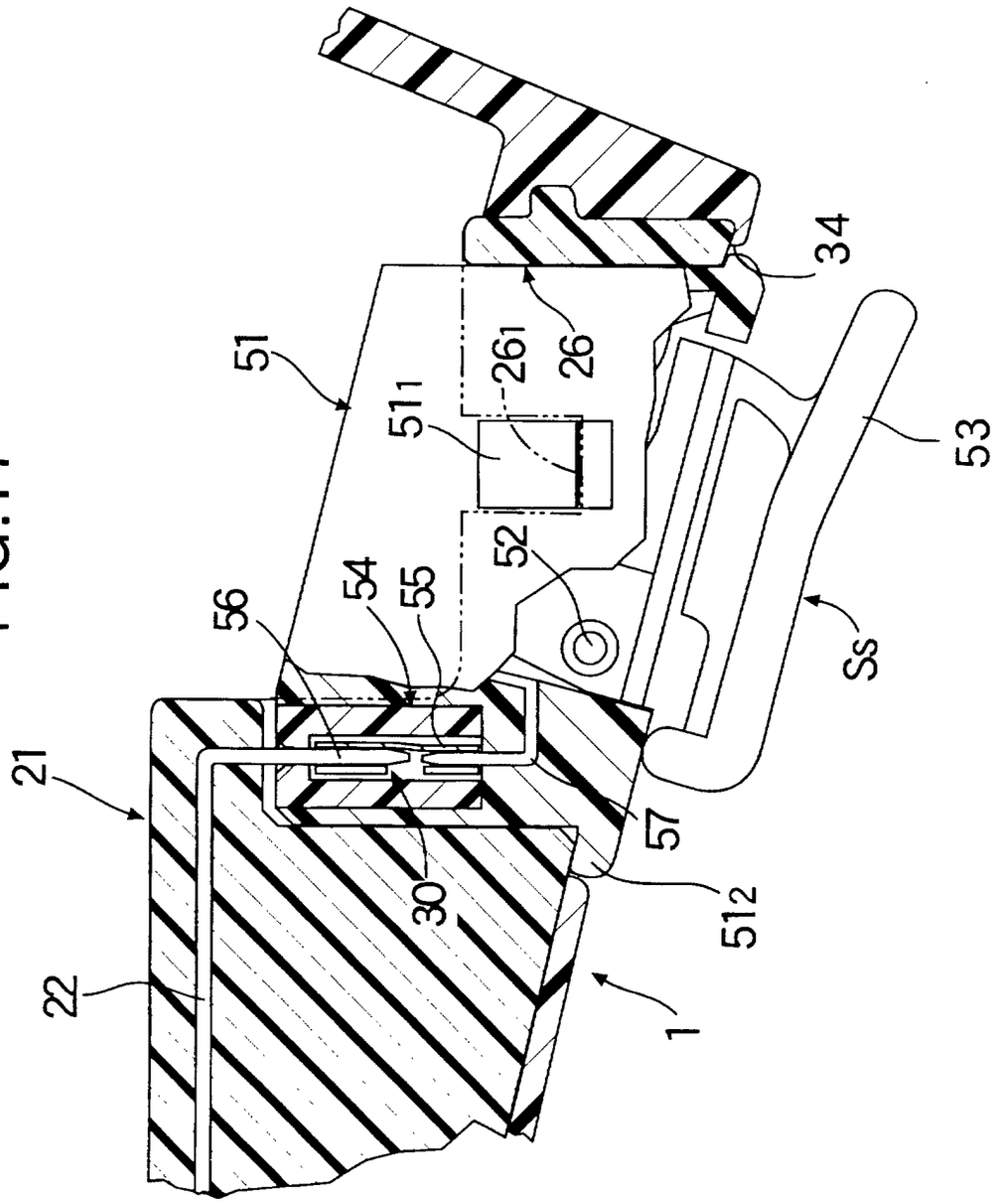

FIG.18